

CLAIMS

What is claimed is:

1. A fibre channel switch comprising:
 - 5 a plurality of input/output modules, each input/output module having a plurality of fibre channel ports;
 - a plurality of fabric switch modules forming at least one fabric switch to provide connections between the fibre channel ports; and
 - 10 a backplane receiving the first plurality of input/output modules and the plurality fabric switch modules, the backplane having connectors to provide connectivity between the input/output modules and fabric switch modules; and
 - a first set of connections through the backplane between the first input/output modules and one of the fabric switch modules.
2. The fibre channel switch of Claim 1 wherein the first set of connections are connections between the at least one switch and the input/output modules.
- 15 3. The fibre channel switch of Claim 2 wherein the fibre channel switch is a single chassis switch providing up to 64 fibre channel ports.
4. The fibre channel switch of Claim 1 further comprising a second backplane having a second plurality of input/output modules and a second plurality of fabric switch modules.
- 20 5. The fibre channel switch of Claim 4 wherein the connectors of the backplane and the second backplane are configured to provide a second set of connections between the second plurality of input/output modules and the at least one fabric switch of the backplane.

6. The fibre channel switch of Claim 5 wherein the second set of connections comprise jumper plugs.
7. The fibre channel switch of Claim 5 wherein the first and second sets of connections provide up to 128 fibre channel ports.
- 5 8. The fibre channel switch of Claim 4 further comprising third and fourth backplanes having third and fourth pluralities of input/output modules.
9. The fibre channel switch of Claim 8 further comprising third and fourth sets of connections between the at least one switch and the third and fourth input/output modules respectively to provide up to 256 fibre channel ports.
- 10 10. The fibre channel switch of Claim 1 wherein each fabric switch module provides a switch having 16 x 16 switch connectivity.
11. The fibre channel switch of Claim 1 wherein said fabric switch modules are logically arranged to provide two switches.
12. The fibre channel switch of Claim 1 wherein said fabric switch module receive
15 fibre channel frames at speeds of at least one gigabit per second.
13. The fibre channel switch of Claim 1 wherein at least one of the plurality of fabric switch modules is a redundant fabric switch module.
14. The fibre channel switch of Claim 1 wherein the first set of connections is provided by through backplane pins.

15. The fibre channel switch of Claim 1 wherein the plurality of fabric switch modules are crossbar switches.
16. A fibre channel switch comprising:
a chassis including:
5 a plurality of input/output modules, each input/output module having a plurality of fibre channel ports;
a plurality of fabric switch modules forming at least one switch to provide connections between the fibre channel ports ; and
10 a backplane receiving the plurality of input/out modules and the fabric switch modules, the backplane having connectors to provide connectivity between the input/output modules and the fabric switch modules.
17. The fibre channel switch of Claim 16 wherein the connectors provide two sets of connections between each input/output module and the plurality of fabric switch modules.
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18. The fibre channel switch of Claim 17 wherein each fabric switch module provides two switches, each switch having one of said two sets of connections to the input/output modules.
19. The fibre channel switch of Claim 18 wherein the fibre channel switch is a single chassis providing up to 64 fibre channel ports.
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20. The fibre channel switch of Claim 17 further comprising a plurality of loopback plugs for one of said two sets of connections.

21. The fibre channel switch of Claim 16 further comprising a second chassis to provide up to 128 fiber channel ports.
22. The fibre channel switch of Claim 19 wherein each fabric switch module provides one switch.
- 5 23. The fibre channel switch of Claim 21 wherein the connectors are configured to provide a first set of connections between the input/output modules and the fabric switch modules of the chassis and a second set of connections between input/output modules of the second chassis and the fabric switch modules of the chassis.
- 10 24. The fibre channel switch of Claim 23 wherein the second set of connections comprise a plurality of jumper plugs.
25. The fibre channel switch of Claim 16 further comprising three chassis to provide up to 256 fibre channel ports.
26. The fibre channel switch of Claim 16 wherein a plurality of connectors in each
15 chassis are horizontal fabric switch connectors providing horizontal connectivity to the at least one switch.
27. The fibre channel switch of Claim 25 wherein the at least one switch in each chassis has one set of connections to the input/output modules of each chassis.
28. The fibre channel switch of Claim 27 wherein at least one switch has permanent,
20 vertical, horizontal, and diagonal connections to the input/output modules of each chassis.

29. The fibre channel switch of Claim 16 wherein a plurality of connectors in each chassis are diagonal fabric switch connectors providing diagonal connectivity to the at least one switch.
30. A method for expanding a director switch comprising:
- 5 providing an identical number of user ports and fabric switch ports;
 matching the user ports and the fabric switch ports to deliver frames to a desired destination port;
 configuring the user ports using a cable, so as to at least double the capacity of the director switch.
- 10 31. The method of Claim 30 wherein the director switch comprises a fibre channel switch.
32. The method of Claim 30 wherein providing an identical number of user ports and fabric switch ports includes logically coupling two fabric switch modules into one fabric switch module.
- 15 33. The method of Claim 30 wherein providing an identical number of user ports and fabric switch ports includes coupling another chassis having a plurality of input/output modules and a plurality of fabric switch modules.